



AGRICULTURAL SCIENCES

TITLE: Breaking the Barrier: How Seeds Come Through the Soil, from Connecticut Agriculture in the Classroom (<http://www.ctaitc.org>)

SUBJECT: Science

GRADE LEVEL: 5-8. Various factors can be made more complicated for older students.

MATERIAL(S): large glass jar, wet paper towels, two popcorn seeds, two pea seeds, two bean seeds, notebook or journal

OBJECTIVE(S): Students will

- Recognize the differences in roots, leaves and stems
- Understand that stems, leaves, and root systems vary from plant to plant
- Learn the characteristics of plants through scientific observation and experimentation

OVERVIEW:

No two humans or animals are exactly alike. They show differences in hair or eye color or in the shape of the nose and ears. Similarly, plants have distinguishing traits. They show differences in the seed, roots, stems, leaves, fruit, size, form and life span.

Every type of plant has its life cycle. The seed sprouts; the new plant matures and produces flowers. After fertilization, a seed is formed, completing the life cycle.

BACKGROUND:

Moisture, oxygen, and warmth are essential for the process of germination—the sprouting of a seed.

Different types of seeds require varying levels of moisture, oxygen and warmth. The seeds of a tropical plant may sprout in a few days in the presence of heat and water. Other seeds remain dormant in the soil for months before they germinate.

Some seeds will not germinate unless the dense protective coat that surrounds them is broken.

Others require a period of cold temperature before germination takes place.

When seeds are dormant, they lose water to the air and become dehydrated. Once germination begins, they require great amounts of water from the soil to sustain their growth. The water allows the seed to convert its stored energy into food for the sprouting plant.

Once germination is complete, the plant will have leaves and roots to gather the water and minerals needed to sustain its life.

The leaves of a plant are able to turn carbon dioxide from the air into sugars. The plant turns these sugars into starches and stores them in its roots. Some plants store more starches in their roots than others. These plants have become our major root crops. Some of these root crops are: turnips, parsnips, radishes, carrots, beets, onions and potatoes. They are particularly useful because they keep better without preservatives than most vegetables.

VOCABULARY: seed, root, taproot, stem, leaf, germination

PROCEDURE: Students will line the sides and bottom of a glass jar with a wet paper towel.

The first towel is held firmly against the side of the glass jar and the center of the jar is stuffed with wet towels. Students should make sure all the towels are wet and that there is a small amount of water on the bottom of the jar.

Two bean seeds, two popcorn seeds, and two garden pea seeds are then slipped between the glass and the towel lining it.

In the notebook, students will record:

- The date when the seeds were inserted in the jar
- The date when the seeds germinated
- The date when leaves first appeared.

Students will identify and note differences in the way the plants germinate and grow. Students also will observe and record differences in roots, leaves and stems. They might take photographs or draw sketches to include in the planting notebook.